

REMARKS**A. Amendments**

Claim 16 has been amended to recite that the negative electrode comprises the ceramic particles. Support for this amendment is found in Example 5. Claim 22 has been amended to recite that the separator is a "microporous polymer film separator." Support for this amendment is found on page 16, lines 420-423. It is submitted that no new matter is introduced by this amendment. Entry of this amendment is respectfully requested.

B. Pending Claims

Claims 16-30 are pending in the application. There are three independent claims, claims 16, 22, and 26.

Claim 16, and the claims directly and indirectly dependent thereon, recite a lithium battery in which the negative electrode comprises ceramic particles not relating to the charge and discharge reaction of the battery and the gel polymer electrolyte does not comprise the ceramic particles.

Claim 22, and the claims directly and indirectly dependent thereon, recite a lithium battery that comprises a microporous polymer film separator between the positive electrode and the negative electrode and in which the negative electrode comprises ceramic particles not relating to the charge and discharge reaction of the battery.

Claim 26, and the claims directly and indirectly dependent thereon, recite a lithium battery in which the positive electrode, the negative electrode, and the gel polymer electrolyte each comprise ceramic particles not relating to the charge and discharge reaction of the battery.

C. First Rejection under 35 U.S.C. § 103(a)

Claims 22-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Peled, WO 94/24715 ("Peled").

The Examiner asserts that, although Peled does not disclose a separator, the solid electrolyte of Peled is "inherently a separator because it separates positive and negative electrodes." Paper 14, page 3, lines 14-15. This assertion is respectfully traversed.

The claims must be read in light of specification. On page 16, lines 420-423, the separator is described as a "polyethylene microporous film." Applicants submit that the Office assertion that the solid electrolyte of Peled is "inherently a separator" is not consistent with the meaning of the term as used by those skilled in the art or as used in the specification. However, to make the meaning of the term explicit, claim 22 has been amended to recite a "microporous polymer film separator."

This feature is not disclosed by Peled. Peled discloses composite solid electrolytes for use in electrochemical cells. Peled, page 1, lines 7-12. He does not disclose or suggest a battery with a separator between the positive and negative electrodes. Nothing in Peled would motivate a person of ordinary skill in the art to prepare a battery comprising a separator between the positive and negative electrode. Rejection of claims 22-24 as unpatentable over Peled should be withdrawn.

D. Second Rejection under 35 U.S.C. § 103(a)

Claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Peled in view of Tsukamoto, U.S. Patent 5,677,084 ("Tsukamoto"). Tsukamoto discloses an electrode suitable for a chargeable/dischargeable battery. Abstract.

As discussed above, Peled uses a solid electrolyte. Nothing in Peled, Tsukamoto, or the combination of these references would motivate the person of ordinary skill in the art to replace the solid electrolyte of Peled with a separator. Rejection of claim 25 as unpatentable over Peled in view of Tsukamoto should be withdrawn.

D. Third Rejection under 35 U.S.C. § 103(a)

Claims 26-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Peled in view of Tsukamoto, and further in view of Blonsky, U.S. Patent 5,648,011 ("Blonsky").

Blonsky discloses gelled electrolytes that comprise inorganic oxygen compounds such as silica, titania, alumina, magnesium oxide, and barium oxide. Abstract.

Applicants' claims 26-30 recite that the positive electrode, the negative electrode, and the gel polymer electrolyte each comprise ceramic particles not relating to the charge and discharge reaction of the battery. The Office asserts that Peled discloses a battery in which ceramic particles are incorporated into the polymer electrolyte and the cathode. The Office has not asserted that either Peled, Tsukamoto, Blonsky, or the combination thereof discloses or suggests a battery in which ceramic particles are incorporated into the anode.

The Office has not made the *prima facie* case. The combination of Peled, Tsukamoto, and Blonsky does not produce applicants' invention because this

feature, a battery in which ceramic particles not relating to the charge and discharge reaction of the battery are incorporated into the anode, is missing from the combination. Rejection of claims 26-30 as unpatentable over Peled in view of Tsukamoto, and further in view of Kawakami should be withdrawn.

E. Fourth Rejection under 35 U.S.C. § 103(a)

Claims 26-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Peled in view of Tsukamoto, and further in view of Kawakami, U.S. Patent 5,888,666 ("Kawakami").

Applicants' claims 26-30 recite that the positive electrode, the negative electrode, and the gel polymer electrolyte each comprise ceramic particles not relating to the charge and discharge reaction of the battery. The Office asserts that Peled discloses a battery in which ceramic particles are incorporated into the polymer electrolyte and the cathode. The Office has not asserted that either Peled, Tsukamoto, Kawakami, or the combination thereof discloses or suggests a battery in which ceramic particles are incorporated into the anode.

The Office has not made the *prima facie* case. The combination of Peled, Tsukamoto, and Kawakami does not produce applicants' invention because this feature, a battery in which ceramic particles not relating to the charge and discharge reaction of the battery are incorporated into the anode, is missing from the combination. Rejection of claims 26-30 as unpatentable over Peled in view of Tsukamoto, and further in view of Kawakami should be withdrawn.

The Office asserts that polyethylene oxide (PEO) is an "inherently gelled" material and has maintained this position despite applicants' submission of references that show that polyethylene oxide is a water-soluble polymer, a property not consistent with the Office assertion that polyethylene oxide is an "inherently gelled" material. The Office "does not find this argument

persuasive" because although polyethylene oxide may be water-soluble "there is no evidence to suggest that it is soluble in an organic solvent such as that used as the electrolytic solution of Peled et al." Paper 14, page 5, line 20, to page 6, line 6 (emphasis original). Although this point is moot because, as noted above, the rejection is improper because the Office has not made the *prima facie* case, for purposes of the record, applicants continue to traverse the Office assertion that polyethylene oxide is an "inherently gelled" material.

F. Fifth Rejection under 35 U.S.C. 103(a)

Claims 16-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Angell, U.S. Patent 5,849,432, in view of JP 7-153495.

Angell discloses electrolyte solvents for use in liquid or rubbery electrolyte solutions. Abstract. The Office admits that Angell does not teach a composite cathode that contains a ceramic not relating to charge and discharge of the battery. Paper 14, page 7, lines 5-6.


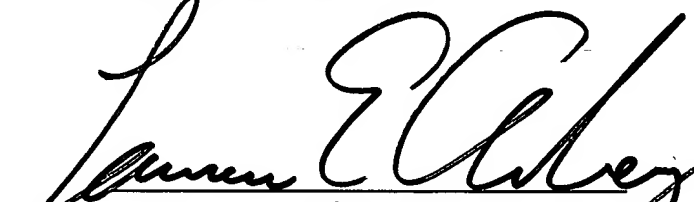
JP 7-153495 teaches addition of one or more oxides to a lithium-containing composite oxide and generating the positive electrode of a lithium secondary battery.

Claim 16 had been amended to recite that the ceramic particles are in the negative electrode. Neither Angell, JP 7-153495, nor the combination thereof discloses or suggests ceramic particles in the negative electrode. Rejection of claims 16-21 as being unpatentable over Angell, U.S. Patent 5,849,432, in view of JP 7-153495 has been overcome.

G. Conclusion

It is respectfully submitted that the claims are in condition for immediate allowance and a notice to this effect is earnestly solicited. The Examiner is invited to phone applicants' attorney if it is believed that a telephonic or personal interview would expedite prosecution of this application.

Respectfully Submitted,



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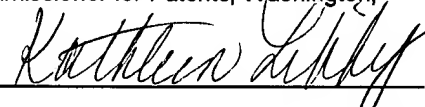
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Kathleen Libby

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1 16. (Amended) A lithium polymer secondary battery comprising:

2 a positive electrode;

3 a negative electrode:

4 a gel polymer electrolyte comprising polymer and an organic electrolyte
5 solution dissolving a lithium salt; and

6 ceramic particles not relating to the charge and discharge reaction of the
7 battery in[at least one of the positive electrode and] the negative electrode;

8 wherein:

9 the content of the ceramic particles is 0.01 to 10 parts by weight in 100
10 parts by weight of active substance in the[at least one] negative electrode[that
11 comprises ceramic particles];

12 the particle size of the ceramic particles is 10 microns or less; and

13 the gel polymer electrolyte does not comprise ceramic particles.

1 22. (Amended) A non-aqueous lithium ion secondary battery comprising:

2 a positive electrode comprising a lithium transition metal compound oxide;

3 a negative electrode comprising an active substance that occludes and
4 releases lithium;

5 a microporous polymer film separator between the positive electrode and
6 the negative electrode; and

7 a nonaqueous electrolyte solution dissolving a lithium salt;

8 wherein:

9 the negative electrode comprises ceramic particles not relating to the charge
10 and discharge reaction of the battery;

11 the content of the ceramic particles is 0.01 to 10 parts by weight in 100
12 parts by weight of the active substance in the negative electrode; and

13 the particle size of the ceramic particles is 10 microns or less.